

EXHIBIT B

EXPERT REPORT OF PETER A. BRADFORD

I. Qualifications and Expertise in Nuclear Power Regulation

I am President of Bradford Brook Associates, a firm advising on utility regulation and energy policy.

I have regulated aspects of nuclear power both as a member of the U.S. Nuclear Regulatory Commission (NRC) and as a member of two state utility regulatory commissions. I served as a member of the NRC from 1977 until 1982. I chaired the Maine Public Utilities Commission (1982-1987 and 1973-1975). I was also a commissioner from 1971-1977. I chaired the New York Public Service Commission (1987-95). In that capacity, I was an *ex officio* member of the New York State Energy Planning Board and the chair of the New York Energy Facilities Siting Board.

In recent years my involvement with nuclear energy has included

- Teaching a course entitled “Nuclear Power and Public Policy” at Vermont Law School (2006-present).
- Serving as a member and chair of the state of Vermont’s Public Oversight Panel for the reliability audit of Vermont Yankee done pursuant to Act 189 (2008-10).
- Serving as one of Vermont’s two representatives on the Texas/Vermont Low Level Waste Compact Commission (2011).
- Serving as a member of the Keystone Center’s “Nuclear Power Joint Fact Finding” (2006-2007) and the National Research Council of the National Academy of Science’s Committee on “Alternatives to the Indian Point Energy Center for Meeting New York Electric Power Needs” (2005-2006).
- Testimony, speeches and articles with regard to issues involved in the construction of new nuclear units and other aspects of nuclear power and nuclear safety.
- Numerous television, radio and print media interviews about the accident at Fukushima and its implications for nuclear power in the U.S. and elsewhere.
- Serving as a member of the International Expert Panel advising the European Bank for Reconstruction and Development assessing the economic case for completing Khmelnytsky 2 and Rovno 4 (K2/R4) – two partly built nuclear units in Ukraine – to replace the two operational 1,000 MW units at Chernobyl (February, 1997).

My complete resume is attached to this report as Appendix 1.

II. Facts and Data Considered in Forming Opinions/Developing Testimony

The opinions expressed in this report are based on my personal experience over the past four decades as a state and federal regulator, on my expertise in laws and regulations governing nuclear power plants, and my knowledge of regulatory actions taken in Vermont and elsewhere

that relate to nuclear plants. Documents that I have reviewed include the Board order in Docket 6545 approving the purchase of Vermont Yankee by Entergy, the March 4, 2002 Memorandum of Understanding between Entergy, the Department of Public Service, and other parties (on which the Board expressly relied in issuing its order approving the sale), the Board Order in Docket 6812 issuing a certificate of public good for Vermont Yankee's increased output, the Board Order in Docket 7802 issuing a certificate of public good for dry cask storage at Vermont Yankee, Act 189 of 2008, Act 74 of 2005 and Act 160 of 2006 and S. 289 of 2010 of the Vermont General Assembly, Environmental Costs of Electricity by the Pace Center for Environmental Legal Studies (1990), Vermont Board Order of 12/28/1984 in case 4701 (Petition of Ratepayers for Proceedings to Inquire Into the Impact on Rate Structure and Economic Feasibility of Continued Investment by the Following Utilities Station Units I and II,) George Mazuzan and J. Samuel Walker, Controlling the Atom: The Beginnings of Nuclear Regulation 1946-1962 (University of California Press, 1984,) Dan M. Berkovitz, "The Role of the States in Nuclear Regulation", essay in David O'Very et al, Controlling the Atom in the 21st Century (Westview Press, 1994,) James Bonbright, Albert K. Danielson, David R. Kamerschen, Principles of Public Utility Rates, (Public Utility Reports, Arlington, Va., 1988,) p. 208, and Energy Choices Revisited: An Examination of the Costs and Benefits of Maine's Energy Policy, a study for Mainewatch Institute by Economic Research Associates, the American Council for an Energy Efficient Economy and the Tellus Institute, 1994. I have also reviewed the order of the District Court denying the preliminary injunction in Entergy v. Shumlin and Entergy's complaint and related pleadings as well as the state of Vermont's responses thereto. I have also read the related declarations. I have also reviewed the Supreme Court decisions in Pacific Gas and Electric Company v. State Energy Resources Conservation & Development Commission and in Silkwood v. Kerr-McGee Corporation.

With respect to the implementation of Act 189, I have relied on my personal participation as a member of the Public Oversight Panel and have considered information from the following reports: Reliability Assessment of the Vermont Yankee Nuclear Facility, dated December 22, 2008 (redacted version); Supplemental Report to the Comprehensive Reliability Assessment of the Vermont Yankee Nuclear Facility, dated April 30, 2010 (redacted version); Report of the Public Oversight Panel on the Comprehensive Assessment of the Vermont Yankee Nuclear Plant, dated March 17, 2009, and Supplemental Report of the Public Oversight Panel Regarding

the Comprehensive Reliability Assessment of the Vermont Yankee Nuclear Power Plant dated July 20, 2010.

III. Statement of Opinions and Bases and Reasoning

1. States have long been involved in the oversight and regulation of nuclear plants.

The regulation of electric utilities and electric generators is a matter that has historically been the responsibility of the states. At the beginning of the electric power industry, issuing of franchises and setting rates was often handled by state legislatures directly. As this work became more complex and involved more industries, states created utility regulatory commissions to discharge utility regulatory functions pursuant to the policies set forth in the laws creating the commissions. Of course, the state legislatures retained the power to change the laws, and frequently did so. Among other reasons for changing the laws were the emergence of new technologies (including nuclear energy and energy efficiency), new institutional arrangements (including independent power production and electric industry restructuring), increasing concern regarding environmental impacts and the runaway rate impacts of the first round of nuclear construction in the 1970s and 1980s.

Although the federal government has exclusive responsibility for *regulating* the radiological safety of nuclear plants, states continue to play a substantial and critical role in the oversight of these plants.

a. The NRC recognizes that it has no role in the energy-planning decisions of state regulators and that state and federal concerns legitimately and unavoidably overlap.

I was appointed to the NRC by President Carter in July 1977 and confirmed by the Senate in August. I served as a member of the NRC from August 1977 through March 1982. I was one of five commissioners responsible for, among other things, decisions relating to licensing of new nuclear power plants and regulating nuclear power plants already in operation. During my term the NRC issued approximately 20 licenses permitting construction or operation of nuclear power plants. I doubt that any NRC commissioner appointed in the 30 years after me has taken part in the licensing of as many proposed new reactors. The NRC during these years dealt also with the accident at Three Mile Island, which led to requirements for NRC-approved evacuation plans to be developed by state and local governments for the areas around nuclear power plants.

My term on the NRC concluded just before the Supreme Court decision in the Pacific Gas and Electric case. Within the NRC and the nuclear industry at that time many people

believed that the California law giving rise to that case was obviously intended to regulate aspects of nuclear safety and would therefore be held preempted. Nevertheless, the NRC clearly understood that states had final responsibility for energy planning and had legitimate interests in the area of nuclear safety as well, so long as they were not regulating it (see discussion of the Illinois Emergency Management Agency's (IEMA) Division of Nuclear Safety below, pp. 13-14).

Because of my background as a state utility regulator, I took particular interest in harmonizing state and federal regulation relating to nuclear power plants. I represented the NRC at the meetings of the National Association of Regulatory Utility Commissioners (NARUC), of which the NRC was one of several federal members. In addition, I was a member of NARUC from 1971 until 1995 and served as President in 1987-88. I chaired the Nuclear Issues subcommittee of NARUC's Electricity Committee for several years in the 1980s. Both as an NRC member and upon returning to state regulation, I urged NRC commissioners to include state regulators when they visited nuclear power plants in order to increase mutual understanding of the impacts that the decisions of each body had on the concerns of the other.

Neither the NRC nor the state regulatory community believed that a hard and fast line existed between safety and economic regulation. Indeed, the NRC, a group of Northeastern regulators and the nuclear industry's Institute for Nuclear Power Operations sponsored a 1987 "Safety and Reliability Seminar" at which I spoke. A few excerpts from that speech make clear just how routine and accepted are the longstanding overlaps between safety and economic regulation:

We have a shared interest in maximizing reliability, maximizing predictability and in assuring that the dollars genuinely needed to protect the public safety are wisely assessed and promptly forthcoming....Illinois has a 200 person nuclear safety office. Vermont and Oregon have their own inspectors....State reviews of prudence and competence at shut down or delayed power plants cover much of the same ground as NRC safety reviews. When a "cooperative" state commission passes on the full utility and safety-driven costs of a unit in State A, producing a \$4-5 billion plant, regulators in State B may force cancellation of a plant on which \$2 billion already has been spent because the capacity can be had for less than the (estimated) \$3 billion cost to go.

The issue is not whether states will be involved in safety but whether their involvement will be well-informed and constructive.

To this end, state officials need, among much else, honest assessments of the likely effects of incentive ratemaking proposals...They need – and have waited too long already – a responsible assessment of the likely decommissioning technologies and their costs.....They need to know what the bill is likely to be for other issues relating to plant

aging, such as embrittlement, and where qualified personnel will come from in an industry with few growth prospects.....

The NRC in its turn needs a receptive ear from the states with regard to its best assessments of the safety consequences of state ratemaking decisions.¹

Indeed, the nuclear industry has at times urged state utility regulators to undertake ratemaking policies that would influence construction and operation – sometimes even safety – of nuclear power plants. The nuclear industry, for example, urged state regulators to allow their utilities to share in the cost of cleaning up after the Three Mile Island accident on the grounds that the job needed to be done more quickly than the plant owner would be able to do alone. The industry urged caution during the electric restructuring proceedings of the 1990s lest increased competitive pressures cause corner cutting in nuclear plant operation in ways that might compromise safety. More recently, the industry, including Entergy, has strongly supported rate-setting policies that charge customers for new nuclear units many years before they enter into service because such credit support is essential to the construction of these new nuclear units. In short, the nuclear industry has never seriously maintained that state regulators must avoid decisions that strongly impact nuclear construction and operation.

b. States may regulate nuclear plants with respect to a variety of non-safety issues. State regulation, particularly economic and energy-planning regulation, has frequently affected the construction and operation of nuclear plants.

As a state utility regulator and energy planning board member, I was involved in many economic regulatory proceedings (and was aware of many more) that affected the construction and the operation of nuclear power plants. Here are some examples:

- In the mid-1980s, the Maine Public Utilities Commission, like the Vermont Public Service Board, became increasingly concerned that the costs of completing the Seabrook plant were more than the output would be worth. Maine utilities at the time were estimating that the future value of the power would be about \$2200 per kilowatt and the costs to complete the plant would be somewhat less. The Maine Commission ordered Maine utilities to seek buyers (though it never actually ordered a sale). The prices offered were far below \$2200 per kilowatt; indeed, they were far below the estimated

¹ “Where Ignorant Armies Clash By Night”: Relationships Among Nuclear Regulators and Regulated”, Peter A. Bradford, Chair, Maine Public Utilities Commission, Chair-designate, New York Public Service Commission, Nuclear Plant Safety and Reliability Seminar, Valley Forge, Pennsylvania, January 22, 1987.

costs to complete the plant. The Maine utilities negotiated the sale of their shares of Seabrook to a subsidiary of Eastern Utilities Associates for about \$1250 per kilowatt. Some Vermont utilities followed after the Vermont Public Service Board set forth conditions for Seabrook cost effectiveness that were not met.² During these proceedings, in the face of increasing reluctance throughout New England to pay for rising Seabrook costs, Seabrook II was cancelled.

Using the cost of Seabrook II as its yardstick, the Maine PUC set prices to be paid for power (largely renewable energy in the form of wood burning units and municipal trash burners) from independent power producers. Enough such power was available to completely replace Maine's entitlement from both Seabrook units. A subsequent independent study confirmed that Maine's economy benefited substantially from the disengagement from Seabrook.³

- In 1987 and 1988, the New York Public Service Commission took several steps to assure that Long Island would have an adequate power supply even without the troubled Shoreham nuclear plant, which had received a low power operating license and then a full operating license from the NRC. Shoreham had operated at low power. In order to assure the Long Island power supply and return the Long Island Lighting Company to commercial viability, the NYPSC took the lead in negotiating a settlement whereby LILCO sold the plant to the Long Island Power Authority, which decommissioned it. The Department of Energy sued to prevent the transfer of the plant but lost in the Second Circuit. The NYPSC's evaluation of the Shoreham settlement (as well as LILCO's) showed little present value difference whether Shoreham operated or not. Shoreham supporters alleged that serious reliability problems would ensue in the 1990s if the plant didn't run. In fact, Shoreham was replaced by a combination of load management, energy efficiency, renewable resources and natural gas, all reviewed and approved by the New York Public Service Commission. No power shortages occurred.

² Vermont Public Service Board Docket No. 4701, Petition of Ratepayers for Proceedings to Inquire Into the Impact on Rate Structure and Economic Feasibility of Continued Investment by the Following Utilities Station Units I and II, December 28, 1984.

³ "Energy Choices Revisited: An Examination of the Costs and Benefits of Maine's Energy Policy", a study for Mainewatch Institute by Economic Research Associates, the American Council for an Energy Efficient Economy and the Tellus Institute, 1994.

- In June 1989, the voters of Sacramento, California voted to close the Rancho Seco nuclear power plant, which supplied 913 of the Sacramento Municipal Utility District's (SMUD) 2,100 MW load. Using purchased power to bridge the gap, SMUD embarked on a program of extensive energy efficiency coupled with cogeneration, renewable energy and purchased power. This revised set of energy priorities has worked out to the satisfaction of the Sacramento community.⁴
- In the late 1970s, Wisconsin regulators became concerned that the Tyrone nuclear plants then under construction would have unacceptable impacts on Wisconsin rates. They issued an order offering full recovery of costs to date if the plants were cancelled by a certain time but less favorable treatment thereafter. The plants were cancelled.

As shown by these examples, states' economic regulation may have a direct impact on the construction and operation of a nuclear power plant. State and even municipal actions in the past have resulted in the closing of plants and cancellation of construction of new plants. In addition to economic concerns, states also have authority to regulate nuclear plants with respect to land use, the environment, aesthetics, reliability, need for power, choice of power sources and energy diversity, and other energy planning issues.

2. The restructuring of the electric industry in recent decades has not de-regulated independent power generators or removed those generators from state oversight.

Following the enactment of the Public Utility Regulatory Policies Act by Congress in 1978, the function of generating electricity was increasingly performed by power plants that were not part of the monopoly utility structure. With the restructuring of the electric industry in the 1990s, a substantial number of nuclear plants were transferred from their original owner utilities into the hands of a few nuclear operating companies, of which Entergy was one. The Federal Energy Regulatory Commission (FERC) regulates the terms and conditions of any sale of electric power by these independent or "merchant" generators in the wholesale market. However, these generators were not deregulated or removed from state economic oversight. A

⁴ SMUD's history states, "To replace nuclear power, the SMUD Board moved away from the concept of a large central plant toward diverse power sources, such as cogeneration plants, wind power, low-cost purchased power from the Pacific Northwest and Canada, and research and development of renewable resources and advanced technologies like solar, fuel cells, gas turbines and biomass." SMUD's history: 1990s: Moving Into Leadership on Green Energy, Conservation, *available at* <http://www.smud.org/about/history-1990s.html>.

few among many possible examples of continuing state oversight of independent generators include:

- Integrated resource planning (IRP) – Vermont, like many states, engages in integrated resource planning (30 V.S.A. §§202 and 218c).⁵ These states either prepare their own energy plans and/or require their regulated utilities to submit periodic plans covering ten or more years into the future and describing the mixture of new and existing resources that will be used to meet customer needs. Whether prepared by the state or by the regulated entity, the review process usually entails opportunity for public comment and approval or adoption by the state. Often the plan adopted reflects different priorities than those originally proposed by the regulated entities. Once adopted, the plans guide future resource acquisitions. Power plants or power purchase contracts inconsistent with these plans cannot be pursued or can only be pursued with explicit regulatory approval. In Maine and in Vermont, power purchases and power plant construction guided by the IRP process ultimately replaced both Seabrook units.⁶ In Maine, plants and contracts chosen according to IRP and state-approved competitive bidding criteria also replaced Maine Yankee when that plant closed in 1997.
- Externalities and uncertainties associated with different types of electricity generation and conservation – Integrated resource plans may include an assessment of impacts on the environment, on jobs, on land use, and on taxes associated with different types of generation. They often also include assessments of uncertainties associated with cost estimates, scheduling and performance of different generation types. Distribution utilities (like Green Mountain Power and Central Vermont Public Service) may be required to give weight to these

⁵ There is no one definition of IRP, and no single methodology. Vermont law defines it as “a comprehensive, long-term plan for meeting the public's need for energy services, after safety concerns are addressed, at the lowest present value life-cycle cost, including environmental and economic costs, through a strategy combining investments and expenditures on energy supply, transmission and distribution capacity, transmission and distribution efficiency, and comprehensive energy efficiency programs” 30 V.S.A. §218c.

⁶ The recent decision of at least one Vermont utility to purchase Seabrook power at today's market prices gives its customers a far better deal than they would have had paying to complete the plant and then having to carry its full costs for the last 25 years.

considerations in deciding what types of investments to undertake. Such considerations can substantially alter the value of generation sources that would apply if a strict ranking by cost estimate were followed.

- Regulatory review of power purchase contracts – Many states, including both New York and Maine when I served on those regulatory commissions, required review and approval of most types of power purchase contracts. Vermont law (30 V.S.A. §248) still does so. Such review and approval routinely considers and evaluates items of benefit to the state.
- Regulatory review of power plant siting – Many states, including New York when I regulated there and Vermont today, require review of decisions to build or expand power plants even when they are merchant generators. Some states, including Vermont, set special conditions for nuclear power plant review.

Neither PURPA nor the subsequent state and federal restructuring of the electric power industry (which Vermont in any case did not enact) transfer regulation of many important issues involving independent power producers like Vermont Yankee to FERC or any other federal agency. Indeed, FERC has no jurisdiction over any aspect of Vermont Yankee other than its terms of service, and that jurisdiction increasingly takes place in the context of oversight not of the power plant but of the New England Independent System Operator. As with all power plants (except hydroelectric units), FERC's jurisdiction does not extend to the power plant itself.

Vermont Yankee's rates, like those of Maine Yankee, were FERC-regulated from the plants' inception because the separate Yankee corporate structure made the sales between the Yankee plants and their utility owners "wholesale" and therefore federally regulated. Nevertheless, state utility commissions in Vermont and elsewhere had jurisdiction (whether or not they exercised it) for a number of other purposes, including siting. In particular, the state commissions had power to review all securities issuances. They reviewed transfers of Yankee generating capacity among local utilities. They reviewed the adequacy of the decommissioning funds. Some states evaluated whether divestiture of power plants (including nuclear plants) was necessary to promote effective competition in generation as part of electric restructuring. In this context they also evaluated claims by some utilities that increased competitive pressure would create incentives to cut corners, producing an adverse effect on nuclear safety. State regulators reviewed corporate reorganizations like Entergy's ENEXUS proposal. They reviewed sales of

nuclear plants such as Vermont Yankee's proposed sale to Amergen and its actual sale to Entergy. They reviewed proposed increases in plant output, also known as "uprates", like the one approved for Vermont Yankee in 2004. They reviewed implications for reserve requirements for the entities that they regulated. None of this jurisdiction was displaced by PURPA or by electric utility restructuring.

Nor was it unusual for states to seek and obtain special economic benefits when reviewing and approving applications of various sorts by nuclear plants or by other types of FERC-regulated independent generators. Entergy has been required to make payments to a renewable energy fund as part of Vermont's approval of dry cask storage. Minnesota imposed a comparable requirement in approving dry cask storage at the Prairie Island nuclear plant. The same Minnesota legislation resulted in annual payments in excess of \$2 million per year to the Prairie Island Indians, some for unrestricted use and some for specific purposes. Entergy also accepted a requirement that it make payments into state funds for the environment and for low income customers as well as to include a "ratepayer protection mechanism" as part of the 2004 order approving the increase in Vermont Yankee's output. Proposed merchant coal plants have committed to planting trees in the tropics to offset their green-house gas emissions in some states or to burn local coal in others. Special "economic development" rates were offered to select customers or areas in New York. None of these arrangements have been held to transgress into FERC's exclusive wholesale rate-setting jurisdiction.

Given that Vermont Yankee, like all merchant and utility-owned nuclear units of which I am aware, sold a significant portion of its output into its host state both before and after the 2002 sale to Entergy, all of the legislation affecting Vermont Yankee enacted by the Vermont General Assembly over the last decade would have been enacted against a background of expectation that sales from Vermont Yankee to Vermont customers would continue for as long as the plant operated.

3. The NRC recognizes that the decision as to whether or not a nuclear plant operates after receiving a license extension is a matter for states and plant owners to decide.

Amendments to the Atomic Energy Act in 1957 and 1959 essentially implemented a three-legged bargain in which the emerging nuclear industry was given a limitation on its liability in the event of an accident and preemption of state and local governments from any role

in regulating radiological health and safety. In return, states were assured a right to participate in the licensing hearings, and those hearings were modeled on adjudicatory, trial-type processes.

With the passage of time, the third leg has eroded away. Licensing proceedings are no longer truly adjudicatory in form, and many basic trial-type rights (such as discovery and cross-examination) have been sharply curtailed by the NRC. However, neither the Atomic Energy Commission (AEC) nor its successor, the NRC, has ever asserted any responsibility for making energy planning decisions for the states. Indeed, since the passage of the National Environmental Policy Act (NEPA) in 1969, the AEC had a strong motive to make clear that it did not have any responsibility for energy policymaking. By so doing, it limited its responsibility in the analysis of alternatives, for it was merely providing an impact statement for the benefit of the real decisionmakers in state government as well as other federal entities and the private sector.

All of the nuclear power plants presently operating in the U.S. were licensed pursuant to a two-step licensing process. That is, a construction permit allowed the plant to be built. An operating license allowed the completed plant to operate. Early nuclear power plants were licensed for forty years from the date of the construction permit. Later ones were for forty years from the operating license date, and the earlier licenses were amended to achieve the same result.

When the first of the 40 year licenses was within ten years of expiring, the NRC began to consider a framework for extending the licenses for another twenty years. This involved extensive reviews of how to regulate to assure public safety in the context of aging plants. The issuance of twenty year extensions also involved preparation of environmental impact statements for each extension. To minimize both the workload and the potential for case by case litigation, the NRC undertook preparation of a Generic Environmental Impact Statement on Relicensing (GEIS). In both the GEIS and the supplement applicable to each power plant the NRC makes clear that an NRC license renewal is in no way a decision that the plant should in fact operate for another twenty years. Whether or not nuclear plants operate after receiving a license extension is a matter for states and plant owners to decide. The NRC's position on this is spelled out in both the GEIS and the final Environmental Impact Statement for Vermont Yankee. These documents explain that the NRC does not have a role in the energy planning decisions of state regulators; that NRC license renewal provides an option for continued power generation by a nuclear plant; that state regulators and utility officials will decide whether a plant will continue to operate; and

that state regulatory requirements and policies may look to matters such as cost, energy efficiency, reliability, improved fuel diversity, and other environmental objections. GEIS, § 1.3; Final Environmental Impact Statement for Vermont Yankee, § 1.4. As the NRC said with respect to Vermont Yankee:

Furthermore, the Vermont Yankee license makes clear that the Generic Environmental Impact Statement on license renewal applies the principle that “the NRC does not have a role in the energy planning decisions of State regulators and utility officials as to whether a particular nuclear plant should continue to operate” to all license renewals.

Final Environmental Impact Statement for Vermont Yankee, § 1.4. I believe that this language describes the NRC position toward its role in reactor construction and operation at least since the *Pacific Gas and Electric* case was decided in 1983.

4. The NRC’s primary role in regulating nuclear safety preempts state regulation that has a direct and substantial effect on nuclear safety, but does not mean that state officials and state legislators are unable to consider issues related to nuclear safety.

Throughout my experience on the Nuclear Regulatory Commission and in state government, state officials and state legislators have had wide leeway to consider and to express themselves on topics relating to nuclear safety. These topics have included safety itself, the costs of meeting safety standards, the interplay between various ratemaking approaches and nuclear safety, emergency planning requirements and the cost of nuclear accidents, to which states may give weight in their integrated resource planning processes. Nothing in the Atomic Energy Act prevents states from looking at or studying these issues. Indeed, emergency planning responsibilities -- which generally fall upon the states -- exist because of the fact that the NRC’s regulation of nuclear plants may fail in ways that will directly impact many state responsibilities.

When I was on the NRC, Illinois became the first state to set up an office explicitly concerned with the safety of nuclear power plants. I don’t believe that either the industry or the federal government challenged its right to oversee aspects of nuclear safety. Illinois maintains a resident inspector at every nuclear power plant site in the state. The web site of the Illinois Bureau of Nuclear Facility Safety proclaims,

The Illinois Emergency Management Agency's (IEMA) Division of Nuclear Safety is devoted to ensuring the safety of people living and working near the 11 operating nuclear power reactors at six sites in the state. With its innovative programs and experienced staff of nuclear experts, Illinois is recognized nationally and internationally as a leader in nuclear safety.

These programs include a one-of-a kind Remote Monitoring System, which monitors conditions in and around each reactor site 24 hours a day; state resident inspectors conducting independent safety inspections at each facility; the Radiological Emergency Assessment Center, where data from the monitoring system is received and analyzed; and a Radiological Task Force that can assess the impact of radiological incidents.⁷

Many other states have or have had nuclear engineering offices at least as large as Vermont's. These include Maine, Massachusetts, New Jersey, Pennsylvania, Oregon and California. These state oversight initiatives have long been accepted by nuclear licensees and the federal government alike, even though they intrude significantly into the realm of nuclear safety.

5. The reliability assessment called for by Act 189 did not intrude on the NRC's regulatory authority.

As the foregoing history makes clear, the NRC has never disputed the power and the duty of states to concern themselves with the reliability implications of nuclear power plants. Given the long history of NRC-state cooperation even in areas of some jurisdictional overlap (which reliability is not), the Vermont General Assembly would have had no reason to think that the subject matter of Act 189 was even close to the line as to federal preemption. After all, Act 189 does not require that the operation or the design of the plant be changed in any way at all, to say nothing of changed in a way that conflicts with or frustrates in any way NRC regulation of radiological health and safety. The only possible concern would have been that the reliability audit might be carried out in such a way as to encompass acts of actual safety regulation. That did not occur.

I was one of the three original appointees to the Public Oversight Panel in June, 2008. I attended all but one of the Panel meetings and took part in many meetings and briefings by telephone. The Panel and the Department of Public Service together defined the scope of work and hired the consultants who carried out the audit. In our first meeting, we requested and received the Department's advice as to potential areas that might give rise to preemption concerns. We also met with a team from the NRC who were conducting a Component Design Bases Inspection of Vermont Yankee. The NRC's attitude toward the state's reliability concerns is expressed in an April, 2008 letter from NRC chair Dale Klein to Governor Douglas, which stated in part,

⁷ <http://www.state.il.us/iema/>

The Vermont State Nuclear Engineer and a mutually acceptable consultant are welcome to observe any NRC inspection at Vermont Yankee in accordance with the existing Memorandum of Understanding between the NRC and the State of Vermont. Regarding your concerns with plant reliability, NRC regulations and its oversight process focus on nuclear safety and security, whether the facility is operating at power or shutdown. Thus the NRC's statutory authority does not extend to regulating the reliability of electrical generation from a nuclear power plant. The NRC recognizes, however, that there is some overlap between licensee performance attributes that result in safe operation and those that contribute to overall plant reliability. Therefore, the NRC safety inspections of Vermont Yankee may aid the State of Vermont in assessing the reliability of the facility in generating electricity.

In the same vein, the Public Oversight Panel's report contains a discussion of the areas of overlap between reliability and nuclear safety (For example, "Events and lapses that undermine reliability can undermine safety, and vice versa. A plant's capacity factor suffers during an extended shutdown, whatever the cause."⁸). This section concludes, "The Panel draws no safety related conclusions. The NSA team's and the Panel's scope was exclusively on the reliability of the Vermont Yankee power plant."⁹

After the Public Oversight Panel reported to the Legislature in March, 2009, we considered our work concluded. However, after the discovery in January, 2010 that the Vermont Yankee pipes from which tritium was leaking were the very "underground piping carrying radionuclides" that Entergy had told the panel did not exist, those of the Panel members who were still available undertook a review to determine the significance of this revelation for the earlier audit and for our own report. The NRC also investigated the leakage, looking at it from a public health and safety standpoint.

The Panel filed a supplemental report on the implications of Entergy's inaccurate statements as to our original conclusions regarding reliability. Our supplemental report included a review of NSA's similar undertaking with regard to their earlier work. Neither the Panel's work nor NSA's involved any regulatory action whatsoever.

6. The legislative purposes set forth in Acts 74, 160, and 189 address matters that are appropriate and reasonable state interests and are not preempted by federal law.

As this report establishes, states have a wide range of issues of concern with power plants, including nuclear power plants, that are not preempted by the Atomic Energy Act. These

⁸ 2009 Panel Report, p. 9.

⁹ Ibid, p. 10.

include energy planning, reliability, land use of a site following decommissioning of the plant, taxation, and economic impacts. The legislative purposes set forth in Acts 74, 160, and 189 include diversity, reliability, economic soundness, environmental sustainability and the need for a smooth transition to a future more reliant on small scale and more renewable electric energy sources. These concerns include also the economics and environmental impacts of long term storage of nuclear waste. These concerns fall comfortably within the zone of legitimate, non-preempted state interest that states have governed for many decades.

Act 74 creates a clean energy development fund based on a charge for the activity of dry cask storage. The statute does not regulate the manner of that storage. It is not different from a great many other state and local enactments collecting various kinds of benefits from power plants or from particular aspects thereof. The legislative findings set forth in Act 74 describe legitimate, traditional state interests in energy planning, including planning for a transition from substantial reliance on VY; creating a more diverse energy supply; and promoting renewable energy sources. Vermont's actions pursuant to Act 74 are fully consistent with state regulatory authority.

Act 160 is explicitly framed in terms of Vermont's energy planning responsibilities, including the evaluation of alternatives and of the full range of costs and benefits contemplated by a certificate of public good proceeding. The state has a broad range of considerations that may be evaluated in this context, and the Act addresses these areas of accepted state authority.

As established above, Act 189 was enacted and carried out with a rigorous focus on reliability. Act 189 was enacted to assist the legislature and the Public Service Board in carrying out their general responsibilities as well as their specific responsibilities under Act 160. Read in the context of the long history of state undertakings in the oversight of nuclear power plants, Act 189 comes nowhere near the prohibited zone of nuclear safety regulation. No less an authority than NRC Chairman Klein recognized in his letter to Governor Douglas that reliability is not an NRC concern and that it is a topic as to which state and federal regulatory jurisdiction necessarily overlap and can easily coexist.

- 7. The generally understood power of a legislature to modify regulatory laws and institutions does not cause a breach, or relieve a contracting party of its duties, in a contract referencing a regulatory body unless the state has explicitly promised that no such modifications will occur.**

Entities regulated by utility regulatory commissions well understand that they have no implied entitlement to an unchanging regulatory process or to an unchanged legal framework unless such an entitlement is explicitly set forth in a contract. Furthermore, state contracts involving regulated entities are strictly construed against finding implied promises that would preclude changes in regulatory policy and approach. It is understood by sophisticated parties to contracts involving regulatory decisionmaking that commissions may change, indeed may even be reorganized or abolished entirely, that laws changing regulatory standards, including the standards for granting certificates of public good, may be enacted, and that Commissions are repositories of a delegated legislative power that legislatures may reclaim. *See, e.g.*, James Bonbright, Albert K. Danielson, David R. Kamerschen, Principles of Public Utility Rates, (Public Utility Reports, Arlington, Va., 1988), p. 208.

Regulated entities have often urged courts and commissions to infer entitlements to a regulatory status quo from various contracts (especially utility franchises). For example, regulated utilities took this position in several states in the 1990s, when utilities argued that an implicit “regulatory compact” coupled with their original franchise contracts with the state gave them a contractual right to full recovery of investments likely to be “stranded” by the introduction of competition. This claim of implied legal entitlement to a contractual status quo was widely rejected, including by Vermont regulators.¹⁰

As Entergy did in the 2002 MOU, they may bargain for and receive substantial benefits in contracts with state government. However, they may not expect courts to imply into these contracts a frozen status quo in the legal or procedural or personnel frameworks that is not expressly stated in the contract itself, and the 2002 MOU does not contain such an express statement.

8. Conclusion

Our federal system allows different states to resolve their energy futures in different ways, usually free from claims of federal preemption. This balance of regulatory power between federal and state governments has made the U.S. power supply system one of the best and most innovative in the world. States are free to implement different energy policies and to learn from

¹⁰ The Power to Choose, Docket No. 5854, slip op. at 56-66 (Vt. Pub. Serv. Bd. Dec. 31, 1996).

their own experiences and those of other states. Vermont's laws and regulatory decisions are very much a part of this tradition.

States' regulation of nuclear power exemplifies this diversity of permissible approaches by states. Vermont's activities with regard to power supply planning, the furtherance of renewable energy and energy efficiency, and control over nuclear energy put the state very much in the mainstream of the group of states that share these concerns and priorities. The energy policies of California, Oregon, Massachusetts, New York and Maine have been in many ways similar to Vermont's over the last 30 years, and each of these states has seen at least one nuclear unit close down. Indeed, three have closed in California and two in New York. The only nuclear plants in Maine and Oregon have closed as well. While the processes have been different in each case, the bottom line has been that the state's regulatory policies created conditions in which the operation of these units ceased. In no instance was a claim of federal preemption made as a result.

While these and other states have energy policies with substantial elements that are similar to Vermont's, states in the south and southeast have passed laws intended to bring about new nuclear construction. Regulators and legislators in the southeastern states speak publicly of the need for expedited NRC approvals and lighter handed federal regulation. None of these states are required to be right about any of this, just to avoid legislating and regulating from a purpose or with the result of altering the safety systems and procedures of nuclear power plants.

IV. Prior Testimony and Compensation

My prior expert testimony within the past four years and my publications for the last ten years are listed on the attached resume.

My compensation for my preparation of this report and testimony in this case is \$250 per hour.

/s/ Peter A. Bradford

Peter A. Bradford

August 8, 2011

Appendix 1

PETER A. BRADFORD

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PROFESSIONAL EXPERIENCE:

Peter Bradford is an adjunct professor at Vermont Law School, where he teaches “Nuclear Power and Public Policy” and has taught “The Law of Electric Utility Restructuring”. He also advises and teaches on utility regulation, restructuring, nuclear power and energy policy in the U.S. and abroad. He was a member and chair of the Public Oversight Panel for the Comprehensive Vertical Assessment of Vermont Yankee Nuclear Power Plant and has served as an expert witness on investment in new nuclear power plants in several states. He is one of Vermont’s two representatives on the Texas-Vermont Low Level Radioactive Waste Disposal Compact Commission. He has been a visiting lecturer in energy policy and environmental protection at Yale University.

He served on the 2007 Keystone Center fact finding collaboration on nuclear power and the 2006 National Academy of Sciences panel evaluating the alternatives to continued operation of the Indian Point Nuclear Power Plants in New York. He is also affiliated with the Regulatory Assistance Project, which provides assistance to state and federal energy regulatory commissions regarding economic regulatory policy and environmental protection.

He served on a panel advising the European Bank for Reconstruction and Development on how best to replace the remaining Chernobyl nuclear plants in Ukraine and also on an expert panel advising the Austrian Institute for Risk Reduction on regulatory agency issues associated with the opening of the Mochovce nuclear power plant in Slovakia. He advised the Vermont Legislature on issues relating to spent fuel storage at Vermont Yankee and the Town of Wiscasset, Maine, on issues related to the storage of spent nuclear fuel at the site of the former Maine Yankee nuclear power plant.

He has advised on electric restructuring issues and has testified on aspects of nuclear power, electricity and telecommunications restructuring in many U.S. states.

He has also advised on energy, telecommunications and water utility restructuring issues in China, Armenia, Azerbaijan, Georgia, India, Indonesia, Mongolia, Canada, Russia, Samoa, South Africa and Trinidad and Tobago. He is a member of the Policy Advisory Committee of the China Sustainable Energy Program, a joint project of the David and Lucille Packard Foundation and the Energy Foundation.

He chaired the New York State Public Service Commission from 1987 until 1995 and the Maine Public Utilities Commission from 1982 until 1987. During these years, New York resolved its stalemate over the Shoreham nuclear power plant and Maine resolved its similarly controversial involvement in Seabrook, both on favorable economic terms. He was Maine's Public Advocate

in 1982 and was President of the National Association of Regulatory Utility Commissioners during 1987.

He served on the U.S. Nuclear Regulatory Commission from 1977 until 1982. During his term, the NRC undertook major upgradings of its regulatory and enforcement processes in the wake of the Three Mile Island accident.

Prior to becoming a member of the NRC, he had served on the Maine Public Utilities Commission (1971-1977) and was Chairman in 1974-1975.

Mr. Bradford was an advisor to Maine Governor Kenneth Curtis from 1968 to 1971, with responsibilities for oil, power and environmental matters. He assisted in preparing landmark Maine laws relating to oil pollution and industrial site selection and was Staff Director of the Governor's Task Force on Energy, Heavy Industry and the Coast of Maine.

Mr. Bradford is the author of Fragile Structures: A Story of Oil Refineries, National Security and the Coast of Maine, a book published by Harper's Magazine Press in 1975. His articles on utility regulation and nuclear power have appeared in many publications, including The New York Times, The Washington Post, The Los Angeles Times, The Boston Globe, The Atlanta Journal Constitution, The Bulletin of the Atomic Scientists, and The Electricity Journal.

He is a 1964 graduate of Yale University and received his law degree from the Yale Law School in 1968.

He is married, has three children and lives in Peru, Vermont.

OTHER PROFESSIONAL AFFILIATIONS:

1999-present - Member, Policy Advisory Committee, China Sustainable Energy Project (funded by the David and Lucille Packard Foundation and the Energy Foundation);
1998-2002 - Member, Advisory Council, New England Independent System Operator;
Nov. 1986-Nov. 1987 President, National Association of Regulatory Utility Commissioners;
1977-1995 NARUC positions, Member, Executive Committee; Member, Electricity Committee (1977-1989); Member, Gas Committee (1989-1993); Member, Communications Committee; (1975-1977); Board of Directors, National Regulatory Research Institute (1985-1987);
1975-1977, 1982-1986. Advisory Council, Electric Power Research Institute;
1987-1995, Member of New York State Energy Planning Board;
1987-1995, Member, Board of Directors, New York State Energy Research and Development Administration;
1987-1995, Member, New York State Environmental Board;
1987-1995, Chair, New York State Energy Facilities Siting Board;
1992-1994, State co-chair, New York State Task Force on Telecommunications Policy;
Vice-chair, Board of Directors, Union of Concerned Scientists;
1995-2007, Board of Directors, Nuclear Control Institute

EDUCATION:

1964 B.A. History, Yale University, New Haven, CT
1968 L.L.B., Yale University School of Law, New Haven, CT

AWARDS:

Honorary Degree, Unity College, 1981.
Environmental Award, Natural Resources Council of Maine, 1979.

PUBLICATIONS

Books

Fragile Structures: A Story of Oil Refineries, National Security and the Coast of Maine, 1975, Harpers Magazine Press.

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